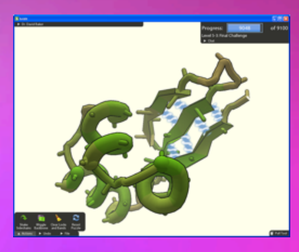
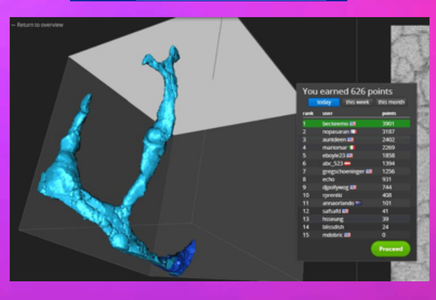
meQuanics:
The Quantum Computer Game

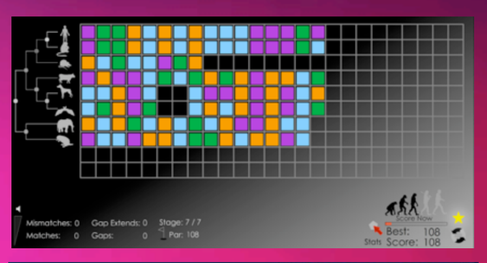
www.mequanics.com

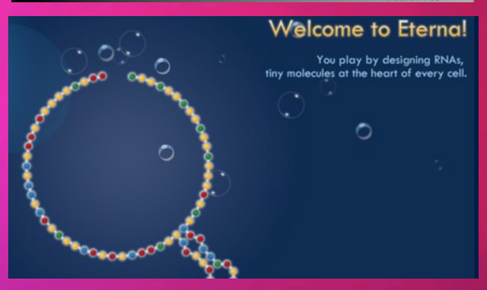
meQuanics is designed to crowd-source the optimisation of topological quantum circuits. Inspired by similar projects in the biological sciences, we are demonstrating a preview version of a game. This game is the first step in programming large scale quantum computers.

The gameplay for meQuanics is set in the future, where quantum computers are used to control human spacecraft. Each puzzle in meQuanics corresponds to a different part of the ship, engines, life support etc... By solving each puzzle you launch the spacecraft into hyperspace. Puzzles with no known solution increase the speed of your vessel. By achieving great scores, you can overtake all the other vessels in front of you.



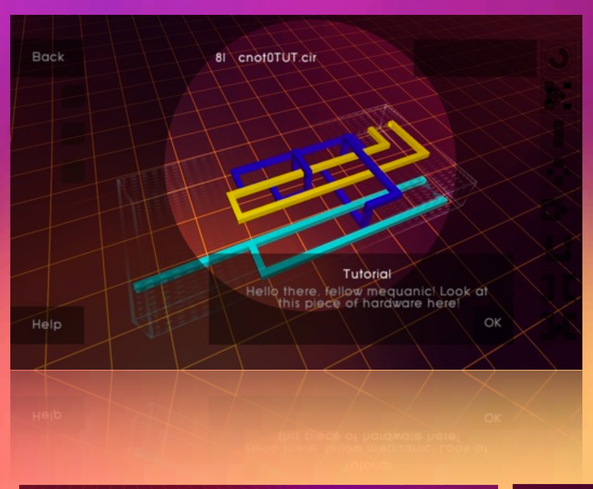




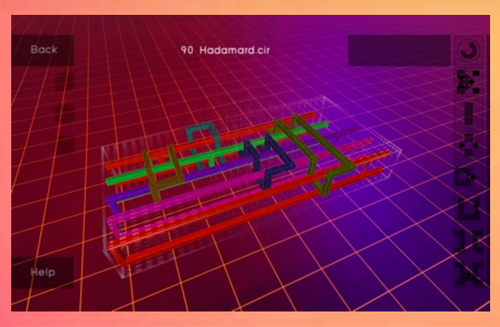


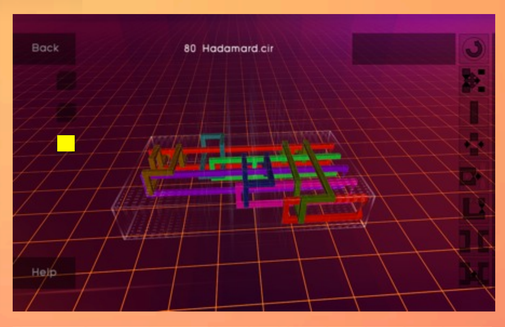
Other scientific games exist, such as FoldIt, Phylo, EyeWire and Eterna. meQuanics is the first game in physics.

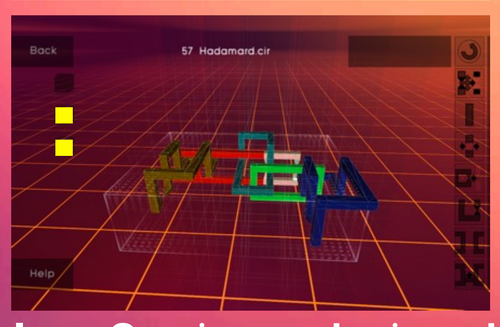
The main menu of meQuanics consists of 19 separate puzzles of varying degrees of difficulty. Some puzzles have known solutions and are designed to introduce users to the basic rules of meQuanics. Six puzzles in this version do not have known solutions and are useful circuits for large scale computation. Finding solutions to these circuits are very important. Our puzzles are named after well known Quantum Information scientists

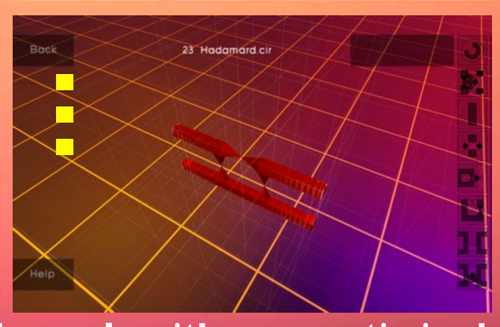


meQuanics has a basic built in tutorial to help guide you through a simple puzzle. As meQuanics is further developed this tutorial will be expanded further

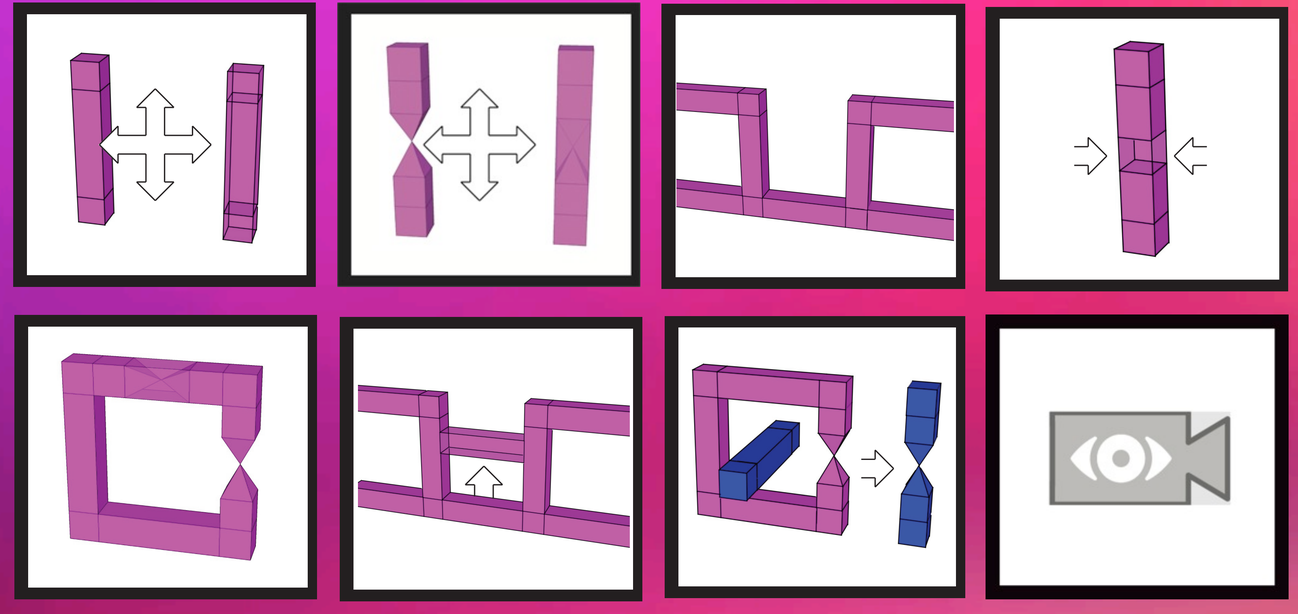






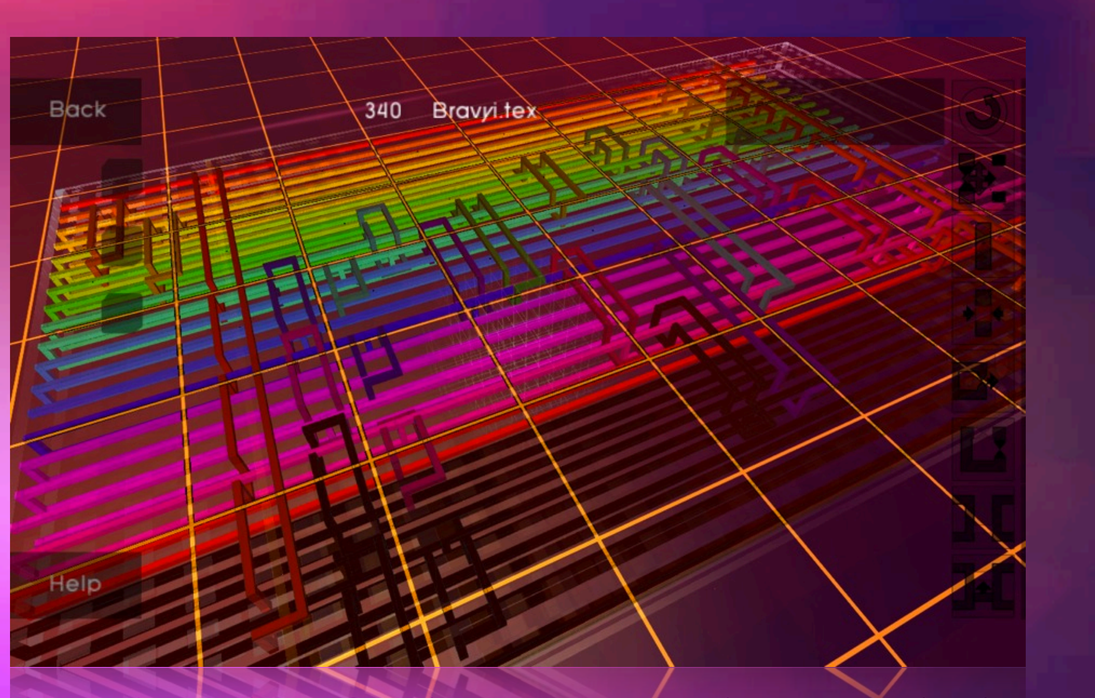


In meQuanics, you begin each puzzle with an unoptimised quantum circuit. Via the game interface you slowly reduce the physical volume of the circuit in order to decrease the number of physical qubits necessary. The current volume of the puzzle is displayed next to its name. As you progress, you are awarded stars as the volume is reduced.



meQuanics has many ways of manipulating the quantum circuit. These rules can be access with the buttons on the right hand side of the display. Our website contains tutorials (www.mequanics.com) to illustrate when and where these rules can be applied.

meQuanics will interact with servers here at NII, so that puzzle solutions are shared with the QIST team. Users will also compete against each other on platforms such as Apple GameCenter and GooglePlay in order to reach the best score. Great solutions to puzzles will be used in automated compilers and published in the scientific community



Large circuits in meQuanics correspond to important circuits in large scale quantum computing. These circuits do not have known optimal solutions. Players who can compress this circuit significantly (i.e. achieves a score of maybe 100 or less) can result in scientific publication.

meQuanics will be released on all major platforms in its final form.

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